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13. ABSTRACT (Maximum 200 words)

During this period of research a substantial research program continued in statistical inference, one that has seen the publication of nearly 100 papers and a book since the initiation of support. The papers written or revised in 1991-1992 are: (1) "An Assymptotic Theory for Sliced Inverse Regression", T. Hsing & R.J. Carroll (2) "Measurement Error Regression with Unknown Link: Dimension Reduction & Data Visualization", Raymond Carroll & Ker-Chau Li (3) "Further Remarks on Robustness in the Logistic Regression Model", R.J. Carroll & Shane Pederson (4) "Semiparametric Comparison of Regression Curves Via Normal Likelihoods", R.J. Carroll & Peter Hall (5) "Theoreticas Aspects of Ill-Posed Problems in Statistics", A.C.M. Van Rooij, F.H. Ruymgaart & R.J. Carroll.

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FINAL REPORT: GRANT AFOSR-89-0240

Raymond J. Carroll, P. I.

OVERVIEW

I was funded by AFOSR from 1975-88 while I was at the University of North Carolina, and from 1988-91 on the current grant. During the 1991-92 fiscal year, I have been on a no cost extension to the current grant, which has not been renewed. I list below the activities which were supported by the current grant.

PUBLICATIONS

- [1] Altschul, S. F., Carroll, R. J. & Lipman, D. J. (1989). Weights for data related by a tree. *Journal of Molecular Biology*, 207, 647-651.
- [2] Stefanski, L. A. & Carroll, R. J. (1990). Deconvoluting kernel density estimators. *Statistics*, 21, 165-184.
- [3] Yin, Y. & Carroll, R. J. (1990). A simple robust diagnostic for heteroscedasticity based on the Spearman rank correlation. *Letters in Statistics and Probability*, 10, 69-76.
- [4] Carroll, R. J. & Hall, P. (1990). Nonparametric estimation of optimal performance criteria in quality engineering. *Annals of Statistics*, 18, 281-302.
- [5] Härdle, W. & Carroll, R. J. (1990). Biased crossvalidation for a kernel regression estimator and its derivatives. *Österreichische Zeitschrift für Statistik und Informatik*, 20, 53-64.
- [6] van Rooij, A., Ruymgaart, F. & Carroll, R. J. (1992). Theoretical aspects of ill-posed problems in statistics. *Acta Applicandae Mathematicae*, 24, 113-140.
- [7] Simpson, D. G., Ruppert, D. & Carroll, R. J. (1991). One-step GM-estimates and stability of inferences in linear regression *Journal of the American Statistical Association*, to appear.
- [8] Carroll, R. J. & Ruppert, D. (1991). Prediction intervals and quantile estimation in nonlinear regression with transformation and/or weighting. *Technometrics*, 33, 197-210.
- [9] Hsing, T. & Carroll, R. J. (1992). Asymptotic properties of sliced inverse regression. *Annals of Statistics*, to appear.

Invited Talks

North Carolina State University
University of Iowa
University of Maryland
Conference on Applied Statistics, Atlantic City
UCLA
Rand Corporation
University of Minnesota
CBMS Errors in Variables Conference
IMA Robustness Conference, Minnesota
Johns Hopkins University
University of New Mexico
Los Alamos National Laboratory
University of Waterloo
Yale University
University of Wisconsin
Cornell Workshop on Function Estimation
Purdue University
Montana State University

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Penn State University	1990
Alaska ASA Chapter	1990
Conference on Discrete Choice Models, Louvaine le Neuve	1990
Australian National University	1991
LaTrobe University	1991
University of Tasmania	1991
Regression Conference, Australian Statistical Association	1991
Australian Graduate School of Management (Innaugural Statistics Lectures)	1991
Statistics Week, University of Miami (Ohio)	1991
University of Alaska, Fairbanks	1991
Penn State University	1991
ENAR National Meeting, Atlanta	1991
North Carolina Chapter, American Statistical Association	1991
Bureau of Labor Statistics	1992
University of Texas at Austin	1992
National Institute of Occupational Safety and Health	1992
ENAR Spring Meeting, Cincinnati	1992
Swiss Statistics Society Spring Meeting	1992
Eli Lilly Conference on Population Pharmacokinetics	1992
Purdue Decision Theory Conference	1992
GLIM 92, München, Germany	1992

HONORS RECEIVED

COPSS President's Award (IMS, ASA, ENAR, WNAR, CSS), 1988.

Ordinary Member, International Statistical Institute, elected 1991.

Distinguished Lecturer in Statistics, Australian Graduate School of Management, 1991.

EDITORIAL RESPONSIBILITIES

Editor, *Journal of the American Statistical Association*, Theory and Methods Section, 1988-1990.

Associate Editor, *Journal of the American Statistical Association*, Theory and Methods Section, (1979-1987), Applications Section (1992-), *Journal of Statistical Planning & Inference* (1992-), *Annals of Statistics* (1983-1988), *Chemometrics and Intelligent Laboratory Systems* (1986-), and *Statistics* (1987-).

APPOINTMENTS

Institute of Mathematical Statistics, Elected Council Member, 1991-94.

Institute of Mathematical Statistics, Committee on Fellows, 1989-1991. (Chair, 1991)

Session Organizer, 1992 Special Topics Meeting of the Institute of Mathematical Statistics, State College, Pennsylvania.

National Institutes of Health, Division of Computer Resources and Technology. Chair of site visit committee for Laboratory for Statistical Methodology, 1991.

National Institutes of Health, Special Study Sections for Statistics, 1988-present (chair, March 1990, July 1990).

Program Chair, 1991 Annual Meeting of the Institute of Mathematical Statistics, Atlanta, Georgia.

Session Organizer, 1989, Annual Meeting of the Institute of Mathematical Statistics, Washington.

Committee member for selection of the President and Council of the Institute of Mathematical Statistics, 1980, 1987, 1989.